

VOLKSWAGEN

GROUP OF AMERICA

California ZEV Investment Plan: Cycle 1

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1. Executive summary

As required by Appendix C to the 2.0-Liter Partial Consent Decree entered by the U.S. District Court for the Northern District of California on October 25, 2016, Volkswagen Group of America is investing \$800 million over the next 10 years on zero emission vehicle (ZEV) infrastructure, education, and access activities to support increased adoption of ZEV technology in California. This represents one of the largest commitments of its kind to date, and Volkswagen Group of America is optimistic that ZEV investments at such a scale will make a material difference in adoption of ZEVs in California. There is a separate investment of \$1.2 billion outside of California that is the subject of a National ZEV Investment Plan being submitted to the Environmental Protection Agency. Volkswagen Group of America and the California Air Resources Board (ARB) will meet bi-annually, and Volkswagen will submit an annual report detailing its progress in implementing the California ZEV Investment Plan.

The investment: The \$800 million commitment will be spent in \$200 million increments over four 30-month cycles. This report describes the \$200 million in investments that will be made in the first 30-month cycle, which runs from Q1 2017 through Q2 2019, to meet this goal.

Cycle 1 (Q1 2017 – Q2 2019)	Cycle 2 (Q3 2019 – Q4 2021)	Cycle 3 (Q1 2022 – Q2 2024)	Cycle 4 (Q3 2024 – Q4 2026)	Full 10 years
\$200M	\$200M	\$200M	\$200M	\$800M

The ZEV investments being made by Volkswagen Group of America will make it easier for millions of Californians to charge their electric vehicles. In addition, Volkswagen Group of America will broadly promote the benefits of ZEVs to consumers through public education campaigns and also take steps to increase exposure to ZEVs. Many consumers do not even consider purchasing a ZEV because of widespread misconceptions about such vehicles and “range anxiety” resulting from inadequate charging infrastructure. Investments in infrastructure, education, and access can go a long way to resolve those concerns and increase ZEV adoption. Volkswagen Group of America has created a wholly-owned subsidiary, called Electrify America, that will be an entity focused on ZEVs that can efficiently and effectively fulfill the ZEV investment commitments under the Appendix C.

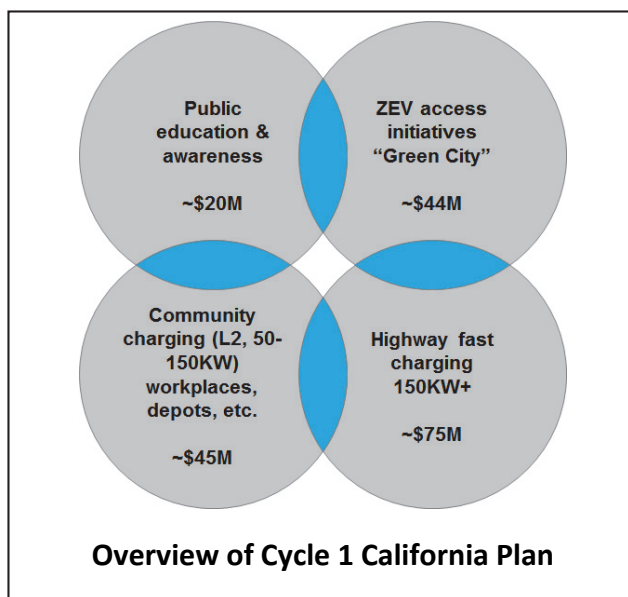
Electrify America is pleased to highlight the many ways that its ZEV investments during the first 30-month period will benefit all Californians, including those in underserved communities. Highlighted in the plan are infrastructure investments and a Green City project that have the potential to support increasing access to ZEVs for a broad variety of California communities, including currently underserved communities.

Electrify America has carefully constructed a plan that considers existing ZEV infrastructure investments in California and projected demand. VW is committed to making ZEV

investments that are incremental to those being made by other private and public entities, and not simply duplicating efforts of others. The brand-neutral education campaigns will be designed to foster increased interest in ZEVs generally, benefitting both auto manufacturers and ZEV charging infrastructure providers, and potentially increasing investment in these areas to the advantage of the market at large.

The Cycle 1 plan: In the first ZEV investment cycle, Electrify America will focus on four activities

aimed at increasing the use of ZEVs and showing more Californians that going electric is possible and beneficial today: (1) Installing charging infrastructure (approximately \$120 million), (2) Building a Green City to showcase the benefits of ZEVs and promote increased ZEV usage (approximately \$44 million), (3) Public Education initiatives (approximately \$20 million), (4) Access initiatives like ride-and-drive events, and an additional approximately ~\$16 million spent on the operational costs of running Electrify America (e.g., personnel, other business expenses). Note that the focus of the



Cycle 1 plan is aligned with CARB's Investment Plan Guidance issued in early February, in particular Section II.A.1 referring to prioritization of infrastructure, public education, access, and making early/visible progress.

INSTALLING CHARGING INFRASTRUCTURE (~\$120 million)

Electrify America plans to build charging infrastructure that will primarily consist of (1) Community charging and (2) A long distance highway network. In addition, other use cases/technologies are also under consideration including destination charging at California state parks to increase access to L2s, and, for higher power DC charging applications, targeted battery storage to manage peak demand, ease grid loads, etc.

A series of guiding principles were applied to identify appropriate infrastructure investments:

- Focus on accessible locations where utilization is expected to be high for ZEV drivers
- Focus on a variety of use cases based on the anticipated charging behaviors of ZEV drivers
- Incorporate anticipated changes in the ZEV industry to maximize usefulness of stations in the medium-to-long term

- Consideration for long term sustainability of the network

Charging stations will be located first in the areas with the highest anticipated ZEV demand; this is based on the forecast penetration rates of ZEVs in each region and the estimated gap between the supply and demand of charging infrastructure in those regions. In aggregate, the Electrify America first cycle investment will aim to establish a network of approximately 2000-3000 non-proprietary chargers across 400+ individual stations. A high-level overview of station locations for the highway network as well as the use cases for the local community-based network are provided in Section 2.2.1.3.

Electrify America stations will be designed to provide access by supporting many existing and anticipated charging technology needs (L2 PHEVs, 50 kW+ DC fast charging), the adoption of non-proprietary charging standards (such as Combined Charging System (CCS) and CHAdeMO), and support for open protocols including Open Charge Point Protocol (OCPP).

To simplify the consumer experience, Electrify America will seek bi-lateral access agreements with owners of other charging networks to make it easy for as many ZEV drivers as possible to enjoy the collective charging networks available.

Community charging (approximately \$45 million)

Through the National Outreach Plan process, Electrify America received many comments and proposals from states, local governments and other stakeholders expressing support for concentrated EV infrastructure investments in specific metropolitan areas.

Electrify America has identified 5 metropolitan areas for the cycle 1 investment (Los Angeles, San Francisco, San Jose, San Diego, and Sacramento). Additional metro areas will be targeted in future investment cycles. Within selected metros, Electrify America plans to build 350+ stations across five major use cases (multi-family homes, workplace, commercial/retail, community, and municipal lots/garages). A deployment mix of L2, 50 kW, and 150 kW chargers will be offered across these use cases to help best meet the anticipated needs of EV drivers. Note that the targeted metro spend is aligned with CARB's Investment Plan Guidance issued in early February, in particular Section II.A.3 referring to transformational programs.

A high-speed highway network (approximately \$75 million)

Through the National Outreach Plan process, Electrify America received many comments expressing support for investment in a nationwide network of high speed EV charging infrastructure along our nation's highways.

Electrify America will build a long distance high speed highway network consisting of approximately 50+ charging stations along high-traffic corridors between metropolitan areas. These stations will focus on 150 kW and 320 kW DC fast chargers; each station will have 5 plugs

on average. These chargers will represent state-of-the-art technology with the fastest charging speeds available. Most currently installed non-proprietary DC fast chargers are in the 25-50 kW range, so Electrify America's stations will be at least 3-6 times faster, which reduces charging times to approximately 15-20 minutes in some cases for new generation, larger battery capacity ZEVs.

The highway network will, in addition to serving highway ZEV traffic, also help to serve disadvantaged communities. In an analysis of the proposed highway network, roughly 25% of stations will fall in areas which score in the bottom quartile on the CalEnviroScreen, and over 50% of stations will fall in areas that scored in the bottom half on the CalEnviroScreen index. This will help provide state-of-the-art infrastructure to disadvantaged communities near major highways, and especially those communities that have significant air pollution issues as a result of being located near a highway. Furthermore, in future investment cycles, Electrify America will conduct additional gap analysis as it relates to infrastructure needs in disadvantaged communities. Note that this is aligned with CARB's Investment Plan Guidance issued in early February, in particular Section II.A.4 referring to disadvantaged communities.

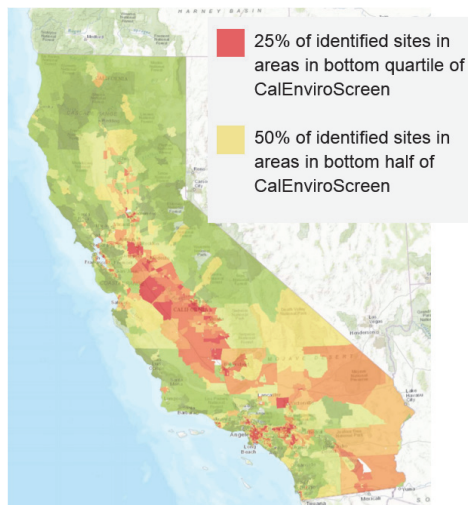


FIGURE 1: OVERVIEW OF CALENVIROSCREEN BY REGION (RED = BOTTOM QUARTILE, ORANGE = THIRD QUARTILE, YELLOW = SECOND QUARTILE, GREEN = TOP QUARTILE).

Building the infrastructure

Preliminary milestones for the network construction progress is shown in Table 1. Site development for the first Electrify America stations will begin in Q2 2017, with development initiated for all stations by Q2 2018. These first stations are expected to be completed and operational for local community charging in Q3 2017 and for highway charging in Q2 2018. Given long lead times in terms of site acquisition and permitting processes, the majority of the stations are expected to be completed near the end of the 30 month cycle, from fewer than approximately 100-150 operational stations in Q1 2018 to 400+ stations by the end of Q2 2019.

	California ZEV infrastructure		
	Pre-site selection	In development	Operational
Q2 2017	300-350	100-150	0
Q4 2017	100-150	200-250	50-100
Q2 2018	0	200-250	150-200
Q4 2018	0	50-100	300-350
Q2 2019	0	0	400+

TABLE 1: PRELIMINARY MILESTONES FOR NETWORK CONSTRUCTION FOR THE CALIFORNIA INFRASTRUCTURE PLAN

Much of this proposed schedule is determined by the lead times associated with various pre-installation tasks, including finding and acquiring sites, permitting, and securing available hardware, each of which can vary considerably based on local factors, the availability of new 150 kW DC fast charging hardware systems and supply chain. Much of the uncertainty around timelines is associated with (1) the site acquisition and design process, which requires contract negotiations with property owners/developers, customization of engineering drawings for specific sites, and the need to identify approximately 5 sites for every 1 final location due to uncertainties through the implementation cycle; and (2) the permitting/approval process, which can take anywhere from 3 to 9 months depending on the permits required at the various levels of government (e.g., local vs. state).

BUILDING A GREEN CITY FOR ZEV ACCESS (~\$44 million)

Electrify America has identified three potential Green City initiatives on which to focus: ZEV car-sharing, ZEV delivery fleet, and ZEV taxi fleet provider. The first 30-month investment cycle for Green City will concentrate approximately \$44 M of funding on developing the foundational infrastructure and planning for the launch of Green City initiatives (currently anticipated to be in Sacramento) as well as the launch of services.

Foundational work for the first Green City initiatives is planned to begin in Q3 2017, including the installation of approximately 75 supporting chargers. Site development for the estimated 75 supporting chargers is planned to begin by Q1 2018, with development completed for all stations by end of Q4 2019. This infrastructure associated with Green City is expected to cost approximately \$11 million.

BRAND-NEUTRAL PUBLIC EDUCATION ACTIVITIES (~\$20 million)

Electrify America received many submissions through the National Outreach Plan process that expressed support for investments that will increase public awareness of ZEVs attributes and benefits.

In order to inform the public education campaign, Electrify America has performed a segmentation analysis of the general car-buying population to evaluate the penetration of ZEVs

in various car-buying population segments and regions, the positioning of ZEVs relative to competition, the barriers to adoption of ZEVs by population segment, and the key messages to communicate to the general population in order to improve penetration of ZEVs. Based on this analysis and an additional analysis of consumer media consumption habits, Electrify America has developed a comprehensive plan to deliver persuasive messaging against both ZEV benefits and overcoming barriers to ZEV adoption. Media will be used to put ZEVs on the “big stage” in order to help consumers understand that ZEVs not only meet the majority of their needs today, but even more so as the charging infrastructure network grows. The messaging will be split across traditional advertising channels such as television, targeted digital, including digital radio, social media, websites, and partnerships, with various platforms to further spread messaging to a variety of demographic segments in California. In order to quickly maximize messaging presence, a coordinated national/local media strategy was developed. This allows for quick ramp-up across the country, followed by sustained messaging in top, high-potential ZEV markets.

The education campaigns aim to increase the public’s awareness of and exposure to ZEVs through targeted campaigns in markets where there are significant opportunities to increase the adoption of ZEVs. The campaigns will highlight that ZEVs today can meet most consumers’ needs, and this will only improve as new vehicles hit the marketplace and as charging infrastructure grows. In terms of content, educational campaigns will simultaneously communicate the benefits of ZEVs (performance, acceleration, quietness, comfort, and the overall enjoyment of the ride) and address barriers to adoption (range anxiety, “golf cart” misperception, charger availability).

ZEV ACCESS INITIATIVES

Numerous governments and other stakeholders proposed ZEV access programs in their comments to Electrify America. Experiential initiatives like ride-and-drive events are being planned to help increase ZEV access and exposure for as many Californians as possible. According to the U.S. Department of Energy, experiential learning activities are one of the most effective ways to drive ZEV adoption because they allow consumers to discover that ZEVs are fun to drive and have other benefits relative to cars with internal combustion engines [*DOE Workplace Charging Challenge*]. The purpose of these activities is to increase the public’s awareness of and access to ZEVs and allow them to experience ZEVs without having to purchase a vehicle.

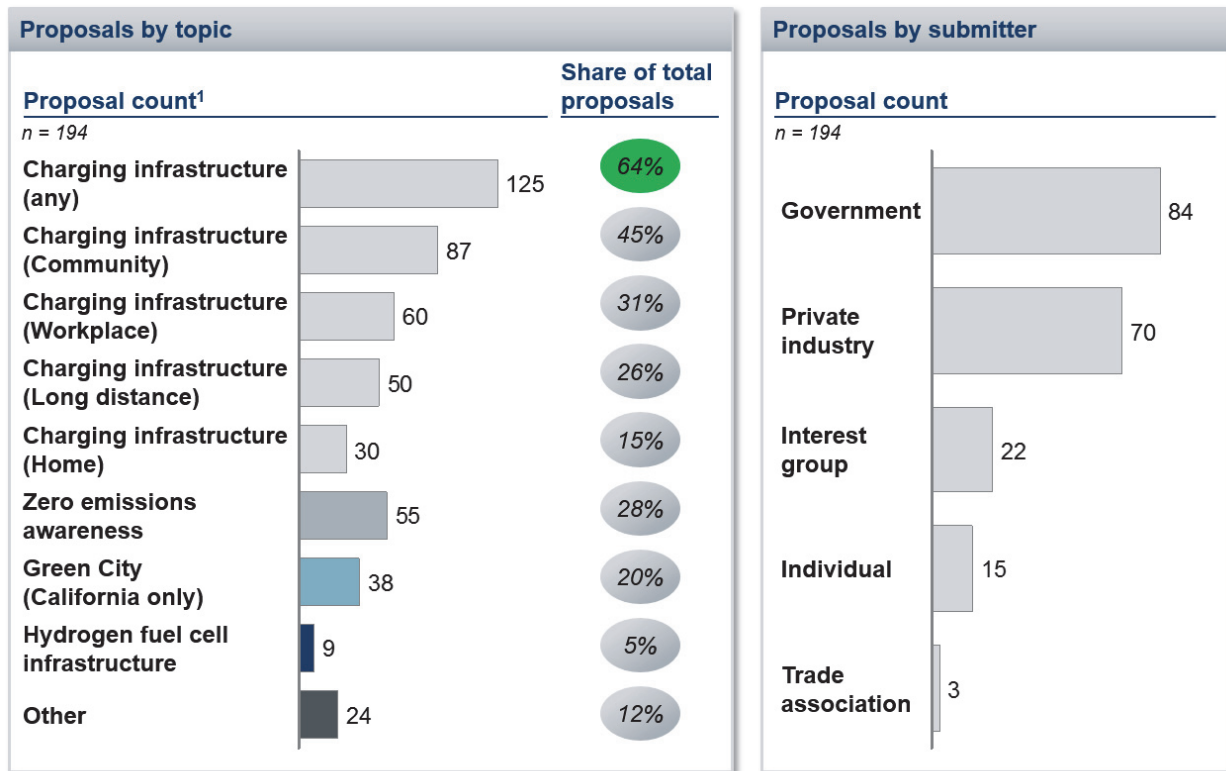
1.2 Summary of Public Comments and their Consideration

1.2.1. Summary of public comments

As part of the National Outreach Plan, Electrify America solicited proposals and recommendations from outside parties to help substantiate and improve this plan. Electrify

America notified stakeholders identified in Appendix C (i.e., states, municipal governments, federally-recognized Indian tribes, and federal agencies) of the proposal submission period, which was open from December 9, 2016 to January 16, 2017. Further detail on outreach efforts can be found in the National Outreach Plan submitted to EPA and CARB on November 9, 2016. Electrify America will continue to consider input from stakeholders over the 10-year life of Appendix C.

For the first 30-month investment cycle, Electrify America allowed a 3-week grace period and considered submissions received through February 6, 2017. A total of 484 submissions were received as of February 6, 2017, 194 of which were from California. Figure 2 provides an overview of the proposals by topic and by type of submitter.



¹ Individual proposal submissions can encompass more than one topic

FIGURE 2: PROPOSAL SUBMISSIONS FROM CALIFORNIA BY TOPIC AND SOURCE

Within California, 33% of submissions were received from the Southern California region, 29% from the Bay Area, 16% from Greater Sacramento, 7% each from the Central Coast and Southern Border regions, 5% from San Joaquin Valley, and 1% each from the Northern California and Northern Sacramento Valley regions, as defined by the California Economic Strategy Panel’s Economic Regions (see Figure 3).

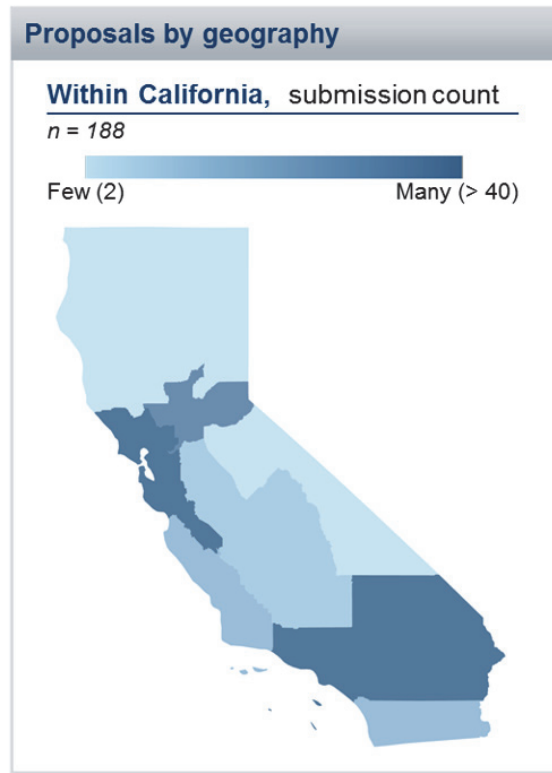


FIGURE 3: PROPOSAL SUBMISSIONS BY GEOGRAPHY

1.2.2. Consideration of comments

Submissions were initially evaluated across a variety of factors including, but not limited to, submission source, speed of implementation, likely charger utilization, and development synergies. Following the initial evaluation, proposals are being categorized based on actionability and forwarded for thorough professional review and sorting to the appropriate internal working teams at Electrify America. Working teams will follow up with proposal submitters in order to clarify submissions, discuss specific ideas, and incorporate some or all of the submission into the plan as Electrify America begins implementing the California ZEV Investment Plan. There is high likelihood that Electrify America will act on proposals that overlap with or optimize priorities identified by Electrify America in the first cycle. Note that *Electrify America intends to respond to everyone who submitted a proposal*. An overview of this process is shown in Figure 4.

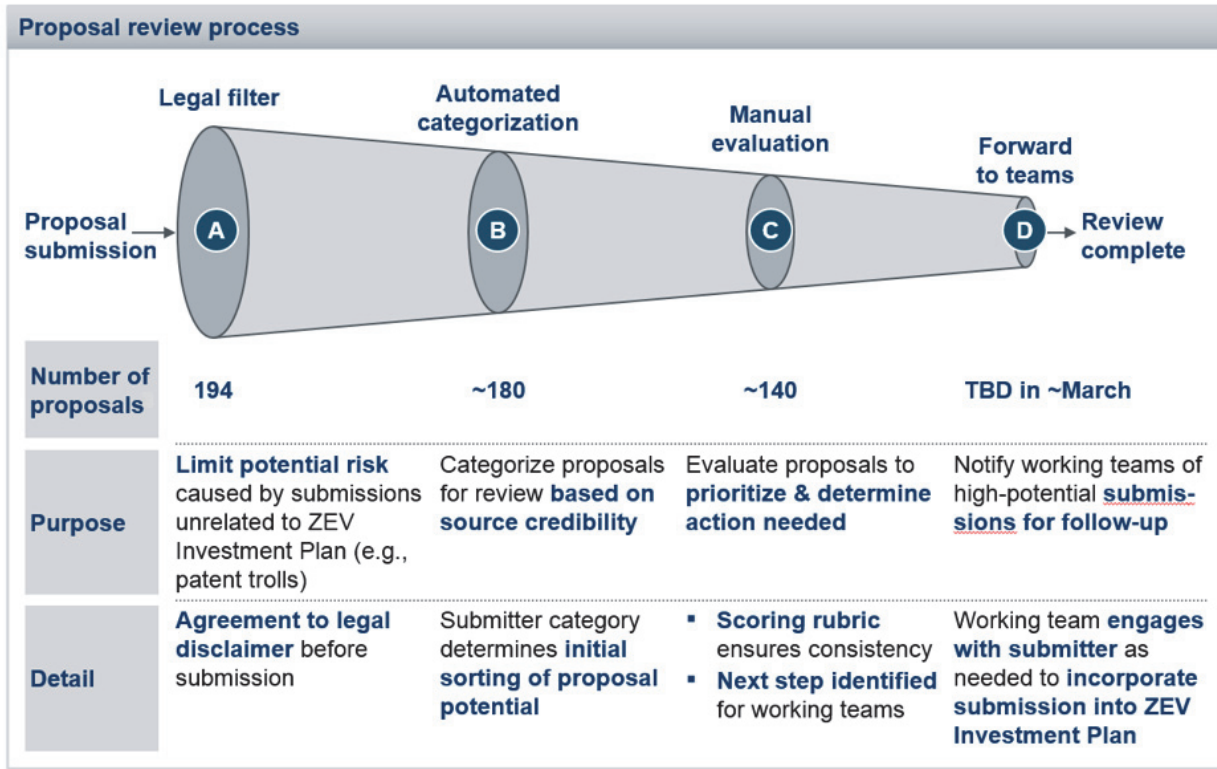


FIGURE 4: OVERVIEW OF PROCESS FOR CONSIDERATION OF PUBLIC COMMENTS

1.2.3. Samples of submitted proposals

A selection of submitted proposals includes the following:

- **Advanced charging infrastructure for underserved (air quality) community:** proposal to install 80-90 L2 chargers and 10-20 DC fast chargers in advanced, net zero energy consumption Carson community for workplace, destination, and commuter charging that is adjacent to 405/110 freeways.
- **Green City proposals:** a number of cities submitted proposals for Green City or related topics, as summarized in Table 2.

City	Proposal #
Azusa	175573
Bakersfield	804641
Bay Area (SF, Oakland, San Jose)	282703; 184250
Davis	805580
Hayward	415831; 427185
Irvine	300420
Long Beach	78046
Los Angeles	676343; 204473; 938108; 262924; 65826; 381204
Monterey	764843; 89696
Riverside	965640
Sacramento	484939
San Diego	320473
San Joaquin	905740
Santa Cruz	569479

TABLE 2: SUMMARY OF CITIES THAT SUBMITTED PROPOSALS FOR GREEN CITY OR RELATED TOPICS.

2. California ZEV Investment Plan

2.1. Overview

Over the course of the first 30 month investment cycle, Electrify America will invest \$200 million in California across four primary areas:

1. ZEV charging infrastructure
2. Green City initiative
3. ZEV public education campaign
4. Access initiatives (under development)

Approximately \$120 million will be spent on charging infrastructure¹, approximately \$44 million on Green City, approximately \$20 million on education campaigns, and the remainder (approximately \$16 million) on operational expenses for Electrify America². Note that all numbers and activities referenced in this investment plan refer to California spend (i.e., excludes spend under the National ZEV Investment Plan) unless otherwise indicated. Figure 5 provides an overview of these planned costs.

Cost category	1 st cycle costs, \$M		
	National	California	Total
Electrify America operations / org	25	16	41
ZEV Infrastructure	250	120	370
Green City	0	44	44
ZEV Education	25	20	43-50
Total	300	200	500

FIGURE 5: OVERVIEW OF COSTS ACROSS CATEGORIES

An overview of the three main investment categories is provided below:

¹ Inclusive of both capital expenses and certain creditable expenses including station fixed costs and demand charges.

² Inclusive of overhead.

1. **ZEV charging infrastructure:** Electrify America will focus on two primary areas for infrastructure investment: long-distance highway chargers and community-based metropolitan chargers. An overview of these investments is provided in Table 3.

	Long-distance highway network	Community-based metro network
Number of stations	50+	350+
Primary technologies	320 kW and 150 kW	150 kW, 50 kW, and L2
Number of highways/metros	~12 highways across California	5 metro areas in CA
Approximate spend	\$65 million	\$40 million

TABLE 3: OVERVIEW OF LONG-DISTANCE HIGHWAY AND COMMUNITY-BASED LOCAL NETWORKS IN CALIFORNIA.

In developing this plan, a number of sources were drawn upon from academia, industry, and government (see Section 2.6. Supporting literature) to ensure investments are focused on high-priority areas where there is clear need for investment in ZEV infrastructure and where likelihood of utilization is highest. Note that approximate spend on the highway network is \$65 million, the community-based network is \$40 million, and there are an additional \$15 million in creditable expenses associated with station operations (fixed costs around maintenance and networking, peak demand charges).

2. **Green City initiative:** Electrify America will begin to establish a green mobility habitat through development of public programs utilizing ZEVs, likely including services such as car-sharing and delivery fleet.
3. **Public education campaigns:** The purpose of these campaigns is to develop a portfolio of brand-neutral media and experiential initiatives that increase the number of people aware of and willing to consider ZEVs.
4. **ZEV access initiatives:** Various experiential initiatives like ride and drive events are being considered to further increase ZEV access.

Overhead and other costs related to implementing this California investment plan are expected to account for approximately \$16 million of Electrify America’s spend in the first 30 month investment cycle. The majority of this spend (approximately \$15 million) will be attributable to operating the business (e.g., personnel).

2.2. Investment types and descriptions

2.2.1. Infrastructure

2.2.1.1. Guiding principles

Electrify America's mission is to establish one of the largest, most technically advanced and customer-friendly charging networks in the U.S. to promote and support the increased adoption of ZEVs. Key guiding principles used to design the network include the following:

- **Focus on locations where access and utilization is expected to be highest:** Investments target highways and metropolitan areas with high current and projected concentrations of ZEV drivers to maximize potential network utilization. In future cycles, the highway charger network can act as an anchor for growth into newer markets along heavily-trafficked corridors. Electrify America also believe it is possible that having chargers available in communities that adjoin highways may increase ZEV usage in those communities, some of which are currently underserved.
- **Focus on a variety of use cases based on anticipated charging behaviors of ZEV drivers:** Electrify America will build chargers to cater to drivers on highways, in public areas (commercial/retail locations, parking garages), in workplaces and multi-family dwellings, and in other viable use cases where appropriate.
- **Incorporate anticipated changes in the ZEV industry by 'future-proofing' stations to maximize their usefulness in the medium-to-long term:** Investment will include the latest technology (from L2s up to 320 kW DC fast charging) and operate across standards (CCS and CHAdeMO) to maximize access and help ensure future compatibility in a rapidly evolving industry. Electrify America will also continually look for new technologies and work to incorporate them in future investment cycles. By focusing on open standards and cross-platform compatibility in the first 30-month cycle, Electrify America will be well positioned to adopt new technologies.
- **Focus on a sustainable business model:** the Electrify America network is being designed to ensure that the network is economically viable and can be operated and maintained for the long term.
- **Focus on interoperability and suitable signage:** the Electrify America network will represent an advanced B2B and B2C platform to support other stakeholders who wish to manage the customer relationship themselves as well as B2C capabilities for customer management by Electrify America. Where possible, bi-lateral agreements will be created with the owners of other charging networks to simplify and improve EV charging for all drivers on multiple networks. Both Electrify America and available state and federal signage resources will be used to the extent possible to further resolve consumer lack of awareness of existing charging infrastructure.

2.2.1.2. Investment selection methodology

The ZEV infrastructure investment plan includes two key components: (1) a high-speed California network to facilitate highway travel between major metropolitan areas; and (2) community-based charging stations in 5 major metropolitan areas. For both components, the following three factors were used to determine the required investment: (a) locations with the

highest ZEV demand; (b) the gap between the existing charging infrastructure supply and projected demand at each location; and (c) the charger count and type needed to meet the excess charging demand at each location. By adopting this methodology, Electrify America is well positioned to install charging stations where they are most needed, as Appendix C requires, and most likely to be used. Note that, throughout this process, Electrify America utilized academic, government, and industry reports on EV charging infrastructure investment, advertising, and projections to develop this plan. Electrify America used peer-reviewed reports to the extent they were available. The reports reviewed are reflected in the sources listed at the conclusion of this report.

2.2.1.2.1. Community-based local network investment selection methodology

The first step in the selection process was to determine the list of metropolitan areas to prioritize for investment. An overview of the process can be seen in Figure 6 and comprises two key steps:

1. Narrowing down the list of metropolitan areas to 5 based on key demographic factors and current hybrid and forecast ZEV sales.
2. Further prioritizing this list based on the extent of government incentives and regulation, local awareness of ZEVs, feedback from utilities and other stakeholders, and quality of fit with the long-distance highway plan.

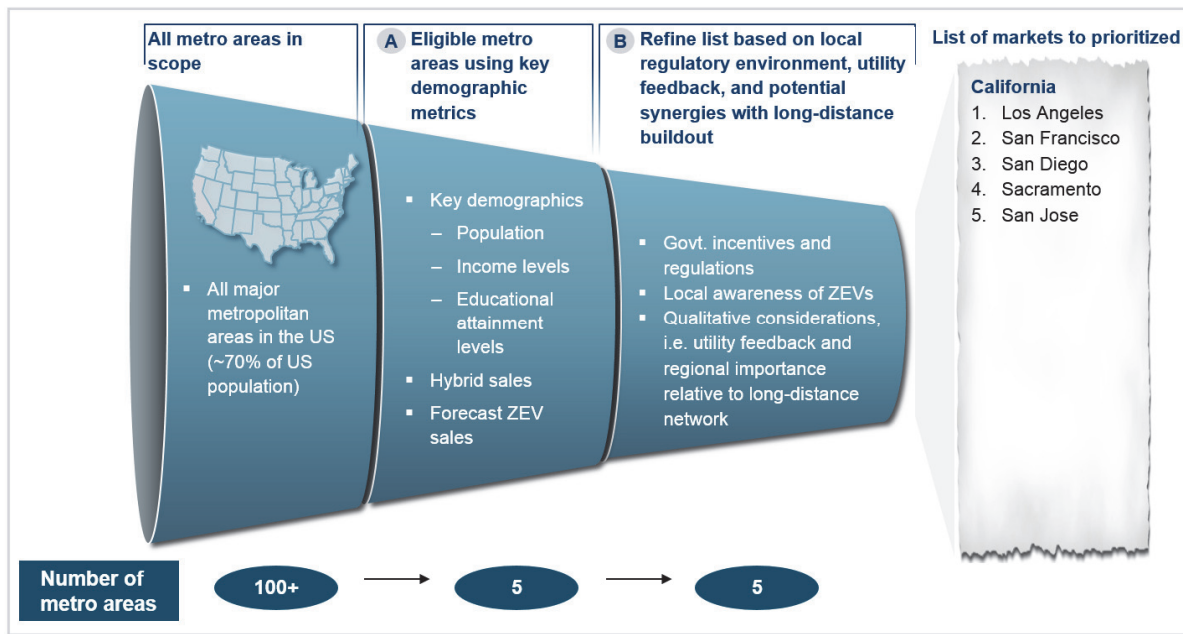


FIGURE 6: OVERVIEW OF METROPOLITAN AREA SELECTION METHODOLOGY

2.2.1.2.2. Long-distance highway network investment selection methodology

The California highway network was designed to place high-speed charging stations along the long-distance routes with the highest estimated ZEV traffic as well as to link prioritized metro areas from the prior section in order to form a cohesive statewide network. Several potential routes shown in Table 4 were identified from: (1) the Census Bureau Statistical Areas (CBSAs) with the highest projected ZEV penetration [Navigant; Experian]; and (2) the most highly-used routes for long-distance travel between these CBSAs based on the FHWA Traveler Analysis Framework [*Federal Highway Administration framework*].

2.2.1.3. Specific description of investments

This section provides an overview of: (1) the quantities and locations of charging stations and (2) the chargers and type/number of connectors per station.

2.2.1.3.1. COMMUNITY-BASED LOCAL NETWORK

Five priority use cases will be supported in the local community-based network in the first investment cycle: (1) multi-family dwellings, (2) workplace, (3) commercial/retail locations, (4) community depots³, and (5) municipal lots/garages. Note that, by supporting a variety of use cases, especially multi-family dwellings, Electrify America will help increase access to charging infrastructure for underserved communities (and this is consistent with CARB's guidance on the topic). These will be focused in five metropolitan areas: Los Angeles, San Francisco, San Diego, San Jose, and Sacramento.⁴ In future investment cycles, Electrify America may increase the number of use cases supported.

³ Community depots are fast-charging stations (similar to highway stations) that are meant for quick charges for commuters.

⁴ San Joaquin Valley metros, while scoring low across metrics used here, will be explored as potential destinations for future community-based investments in subsequent cycles.

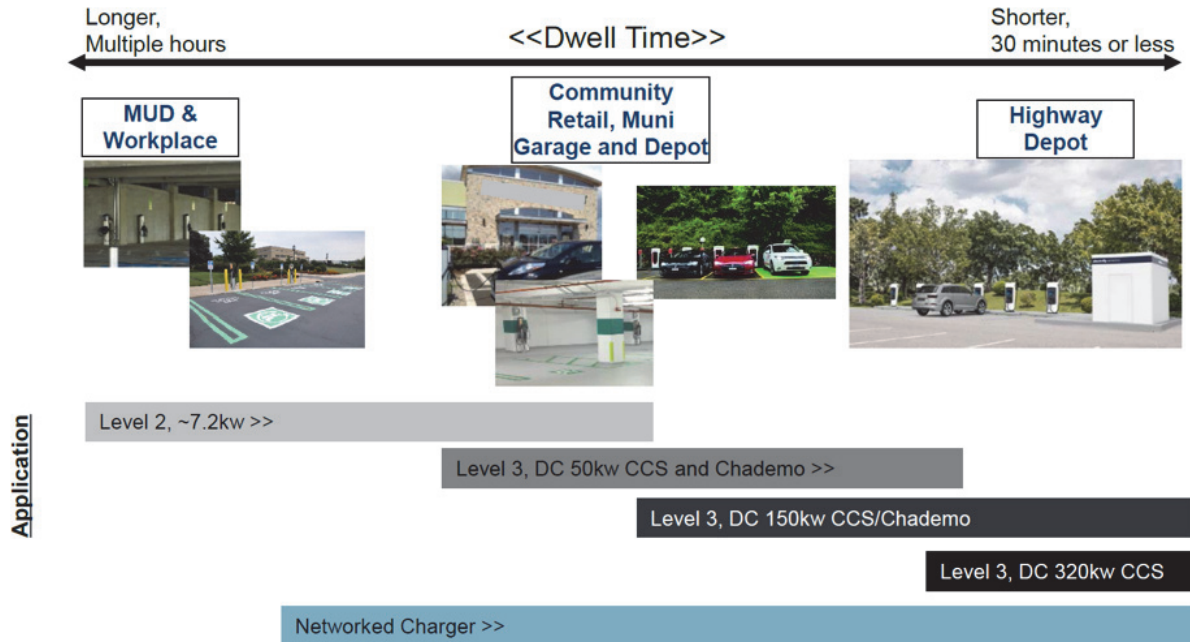


FIGURE 7: OVERVIEW OF MAJOR USE CASES TO BE PRIORITIZED IN FIRST CYCLE

Across use cases, a majority of spending is expected to be devoted to public use cases (commercial/retail centers, community depots, and municipal parking lots/garages), approximately one third of investment will support workplace charging, and the remainder will be spent in multi-family dwellings. In addition to these use cases, there are other programs/technologies under consideration, including an Adopt-a-Charger partnership with California state parks to further build out L2 destination charging.

2.2.1.3.2. LONG-DISTANCE HIGHWAY NETWORK

The highways most likely to be targeted in the first investment cycle are shown in Table 4. The planned typical station configuration for a highway network station is two to three 320 kW and two to three 150 kW chargers (five total chargers).

Prioritized highway	Estimated station count
I-5	15+
US-101	10+
I-80	3-5
I-10	3-5
I-15	3-5
I-8	2-4
CA SR-58	1-3
CA SR-99	1-3
I-580	<2
CA SR-210	<2
US-6	<2
I-405	<2
US-395	<2

TABLE 4: OVERVIEW OF CALIFORNIA HIGHWAYS TARGETED FOR INVESTMENT IN FIRST 30-MONTH CYCLE

2.2.1.4. Infrastructure investment timeline and milestones

The estimated development schedules for both the highway and local community and networks are shown in Table 5. The end-to-end process from site development is a lengthy process with multiple steps and includes the following:

- Ordering equipment
- Development of new property leads
- Signing of lease agreements (or, where appropriate, purchasing property)
- Development of permitting/pre-construction packages
- Filing permits
- Warehousing equipment and Quality Assurance/Quality Control
- Permit approval
- Site preparation
- Equipment delivery to site
- Completion of site construction
- Landscaping
- Utility connection to the grid/inspection and any additional utility preparation including new transformers or upgraded substations
- Commissioning

Note that the length of time needed to complete each step can vary considerably across use cases as well as across geographies (e.g., permit approval timelines can differ substantially from city-to-city and state-to-state). Electrify America has already begun engaging key stakeholders and partners to begin implementation planning. As these relationships develop further, Electrify America will be able to start identifying and acquiring specific locations for chargers. Until vendors are contracted and the investment plan is approved, however, more specific site location data cannot be provided.

Development of the first station is expected to begin in Q2 2017, with the first local community and highway charging stations expected to be operational in Q3 2017 and Q2 2018 respectively. The process is expected to take longer for the highway charging stations due to the higher charging power and more complex technical, real estate, and utility requirements involved. Interim milestones for each 6-month period for the pace of network construction for both the highway and local community charging stations are shown in Table 5.

	Community-based local network			Long-distance highway network		
	Pre-site selection	In development	Operational	Pre-site selection	In development	Operational
Q2 2017	250-300	100-150	0	0-50	0-50	0
Q4 2017	100-150	150-200	50-100	0-50	0-50	0
Q2 2018	0	150-200	150-200	0	50+	0-50
Q4 2018	0	0-50	300-350	0	0-50	0-50
Q2 2019	0	0	350+	0	0	50+

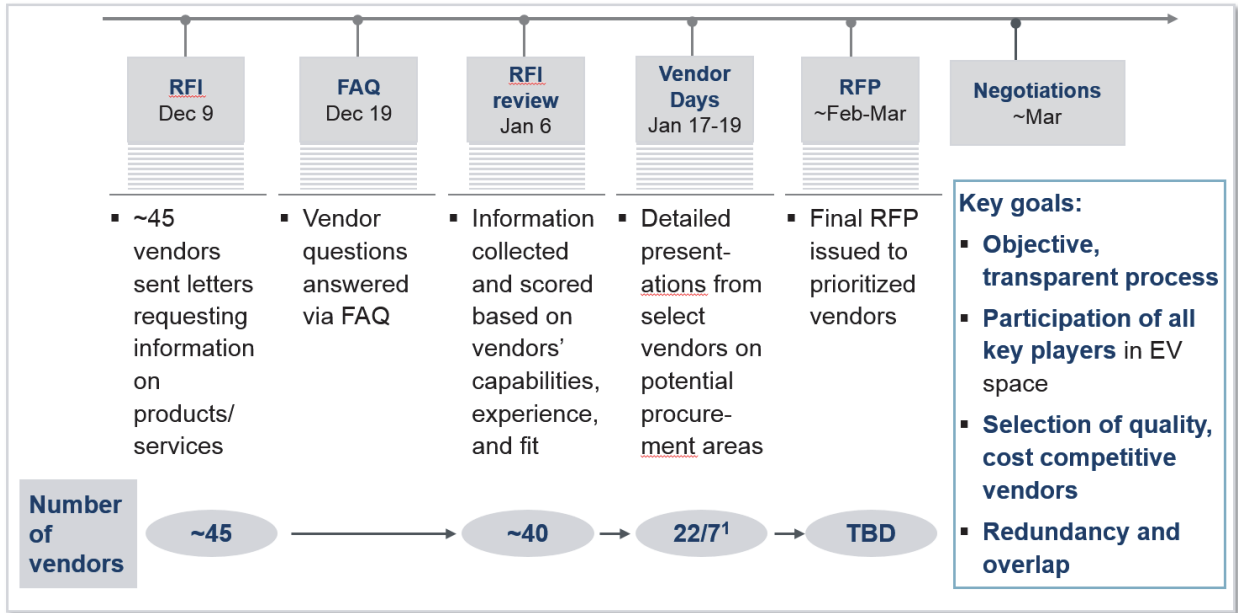
TABLE 5: INTERIM INFRASTRUCTURE DEVELOPMENT MILESTONES (NUMBER OF STATIONS) DURING THE FIRST INVESTMENT CYCLE

Electrify America has made significant progress in selecting vendors to meet these ambitious infrastructure build-out schedules. To date, Electrify America has already met with a large number of vendors across the charging space in a series of “Vendor Days” and will prioritize several vendors across key procurement categories from site identification and acquisition to site maintenance. Note that the RFI process (shown below) is not limiting in that potential partners who did not participate in the RFI process may still be a part of the implementation moving forward when appropriate, and Electrify America will welcome such activities. An overview of the process is shown in Figure 8. Key steps included the following:

- **RFI issuance (Dec. 9th):** 45+ vendors across the ZEV space sent letters requesting information (capabilities across the value chain, relevant experiences, and product/service offerings).
- **FAQ issuance (Dec. 19th):** Vendor questions answered to clarify RFI where needed.
- **RFI response review (Jan. 6th):** information collected and scored based on vendors’ capabilities, experience, and fit with Electrify America’s overall mission. This process

followed a rigorous, objective scoring methodology to best identify vendors positioned to help Electrify America.

- **Vendor Days (Jan. 17th-19th):** Detailed presentations were given by select vendors across procurement categories to provide qualitative highlights of their capabilities and future plans that Electrify America should consider in its forward planning.
- **RFP issuance (Feb. onwards):** For priority procurement areas, RFPs are to be issued as soon as possible.



¹ 22 standup meetings during Vendor Days; 7 additional conference calls outside of that.

FIGURE 8: OVERVIEW OF RFI/RFP PROCESS

2.2.1.5. Maintenance plan for ZEV infrastructure

Electrify America is in the process of issuing RFPs to external vendors to ensure that periodic maintenance will be available across the network for 10 years after the Effective Date and the hardware remains operational over the entire 10 year period. Furthermore, contract terms negotiated after completion of the RFP process will ensure that the charging equipment is marked with a toll-free customer service hotline available 24/7 and that this number will be answered by a live operator if any maintenance issue should arise. Additionally, service response time metrics will be tracked.

2.2.1.6. Data collection and utilization statistics

As part of development of the Electrify America network, a network platform services provider will be contracted to install backend connectivity across the chargers. Standard features of these network platforms, of which there are several existing in the market today, include utilization statistics (charging event frequency, charging event length, kWh dispensed), payment processing, maintenance tracking, downtime, ticket management, and a host of other data services. The chosen platform will be used by Electrify America to collect data and monitor network performance. Note that this is aligned with CARB's Investment Plan Guidance issued in early February, in particular Section II.A.6 referring to data collection and reporting.

2.2.1.6. Interoperability, open access, and competition

In order to maximize public access to its charging network, infrastructure developed by Electrify America will have the ability to service all plug-in ZEVs using a reasonable mix of non-proprietary connectors through the support of multiple charging standards (e.g., CHAdeMO and CCS) across the stations. Electrify America will also work to maintain OCPP compliance and other measures to help maximize interoperability.

Infrastructure will also have the ability to accept multiple payment methods (e.g., subscriptions, mobile pay, RFID, credit cards) to simplify usage as much as possible. In particular, a key part of the business model will be providing true 'pay-as-you-go' access to potential customers, who will be able to use a credit card or other potential payment methods to recharge their vehicles without having a pre-existing relationship with a charging network operator. Note that there is also a disproportionate focus on publicly-accessible infrastructure (e.g., highway chargers, community depots, municipal parking lots and garages) to maximize access as well as promote exposure as broadly as possible.

Through the support of multiple charging standards, the ability to accept multiple payment methods, and a strong focus on publicly-accessible infrastructure, Electrify America will be building a highly interoperable network that provides access to as many consumers as possible. This is consistent with Electrify America's vision to promote 'universal access' as much as possible, well beyond the standards of many current players in the industry.

Electrify America intends to work closely with existing suppliers in the charging industry in order to avoid duplicating their efforts and to take advantage of their knowledge and experience. To the extent possible, Electrify America will purchase equipment and obtain services from companies that are already in the business, rather than spending money to "reinvent the wheel." Electrify America plans to build a charging infrastructure that is sustainable over the long term, which means it will operate in line with the same economic constraints faced by others in the charging industry. Electrify America has no incentive to engage in conduct that could be viewed as predatory, such as below-cost pricing, and it will be

bound by the same laws governing acceptable business practices as every other company in the charging industry. This is aligned with CARB's Investment Plan Guidance issued in early February, in particular Section II.A.7 referring to business competition and conduct.

2.2.2. Green City

2.2.2.1. Guiding principles

The Green City investment's guiding principles are informed by a few key objectives. The Green City investment should offer a set of ZEV initiatives that are accessible to the city inhabitants and create a green mobility habitat. These initiatives should be leveraged to offer residents better quality of life through enhanced mobility and improved air quality. The initiatives can serve as a pilot to help spur the widespread adoption of ZEVs and mobility services.

In order to achieve these objectives, the Green City initiatives should be guided by a few key principles. The initiatives should be designed to be self-sustainable and scalable to other cities in California and beyond. Initiatives should showcase innovative urban green mobility utilizing ZEV technology, improving public awareness and perception.

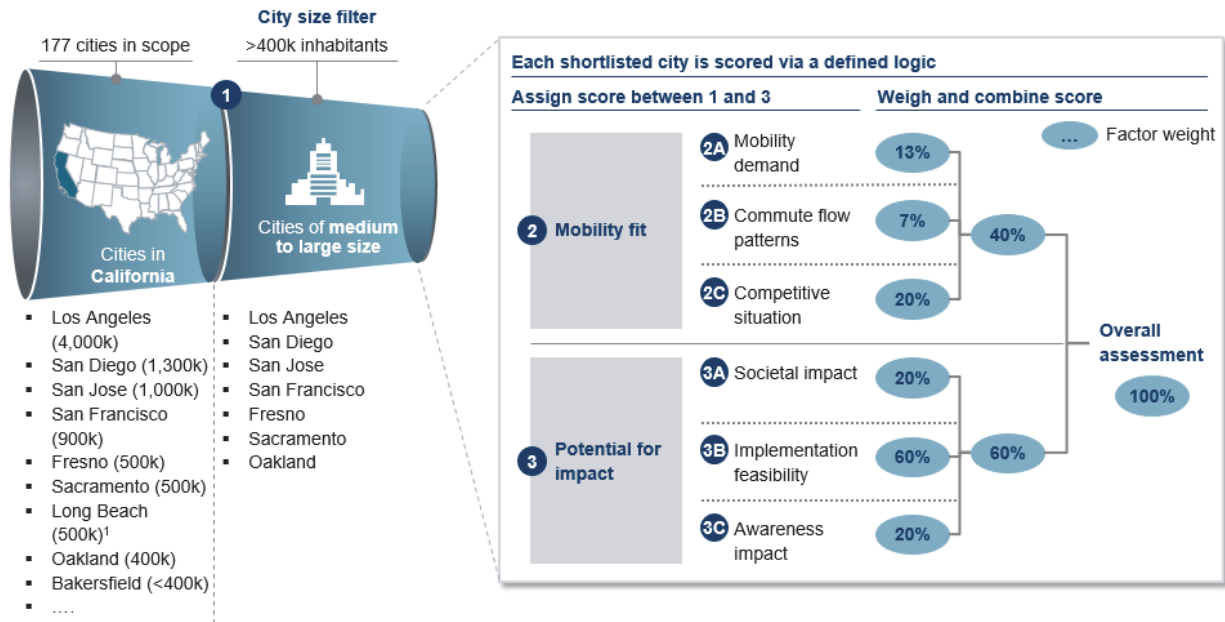
2.2.2.2. Investment selection methodology

In order to determine the location of the initial Green City investments, California cities were evaluated across three primary dimensions:

- 1: City size
- 2: Mobility fit
- 3: Potential for impact

These criteria were selected with the assumption that ZEV car sharing would be one of the primary initiatives developed over the first and second 30-month investment cycles. They were intended to ensure that the Green City initiatives were being developed 1) in a sizeable market where the initiatives could be scaled up over time, 2) in a market where there was demand for car sharing initiatives, suitable commute patterns, and a gap between supply of existing car-sharing fleets and potential demand, and 3) in a market which had a high potential for impact, based on the potential of increasing ZEV access to disadvantaged communities, the likelihood that the initiatives would be developed in an ecosystem supportive of ZEV mobility, and a city with the ability to influence broader awareness in California, Nationally, and more broadly.

City size selection criteria was first applied in order to develop a shortlist of California cities [Auto Bild]. The shortlist was then scored across various sub-criteria (detailed below) within the mobility fit and potential impact and weighted based on relative impact of each sub-criteria (see Figure 9).



¹ Direct border with Los Angeles, thus counted as greater Los Angeles

Figure 9: Overview of city selection methodology

2.2.2.3. Green City investment timeline and milestones

All Green City initiatives require significant lead-time for development and preparation before services can be launched. Creating the foundational or supporting infrastructure to service these ZEVs (i.e., charging stations) will take roughly two years as it includes defining charging requirements, identifying charger locations, acquiring sites, developing land, installing chargers, testing chargers, developing battery backup and solar energy generation, collaborating with local utilities, etc. before use.

In addition to developing the infrastructure, each Green City initiative must be planned and set up appropriately in order to ensure successful launch and operation of services, which could take up to two years. Such preparation could include securing city support (e.g., operational permits, parking permits), establishing contracts with vendors (e.g., garage owners, maintenance providers), developing software (e.g., backend, customer-facing app), placing orders for equipment (e.g., ZEVs, custom hardware), and identifying and hiring staff (e.g., customer support).

Once a Green City initiative has its supporting infrastructure established and planning and preparation are complete, the service can begin operations. Features of launching and operating the service could include deploying the ZEVs, incorporating feedback from various stakeholders (e.g., customers, city officials), and continuing to refine the business model in order to ensure longer-term sustainability.

Given the development and preparation required by Green City initiatives and the investment trade-offs between Green City and Infrastructure funding, the first Green City's initiatives are planned to begin development and initial launch during the first 30-month investment cycle (i.e., late 2017). For planning purposes, Electrify America has developed plans for launching the ZEV car-sharing service and ZEV delivery fleet described above. Technology will be evolving over this period with mobility patterns and platforms evolving and being adopted at different rates and the Green City initiatives will be refined over this time to maximize access, utilization, and the overall sustainability of each of the initiatives.

Preparation for the first Green City will include building roughly 50 electric vehicle chargers to support the ZEV car-sharing initiative and 26 DCFC chargers to support the ZEV delivery fleet. Chargers to support both initiatives are planned to begin site identification by Q3 2017, start construction of the first stations by Q1 2018, and complete construction of all chargers by the end of Q4 2019.

2.2.3. Public Education

2.2.3.1. Investment selection methodology

Total spend allocation within the first 30 month investment cycle for education will be approximately \$20 million in California (\$43-50 million nationally). This spend will be allocated across multiple media channels to reach consumers at critical touchpoints based on their consumption habits, as shown in Figure 10.

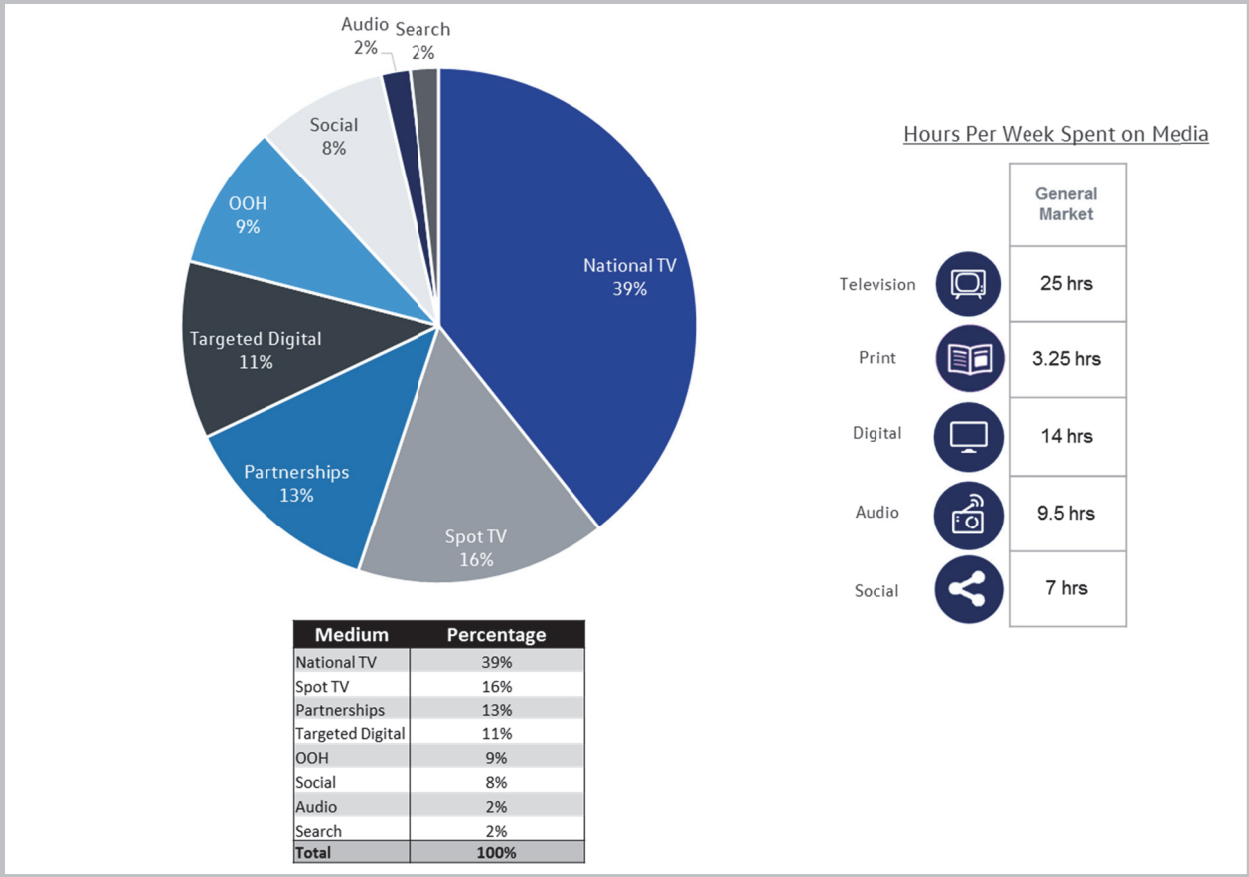


FIGURE 10: OVERVIEW OF GENERAL MEDIA CONSUMPTION HABITS

2.2.3.2. Specific description of investments

Based on segmentation analysis and consumer media consumption habits, we have developed a comprehensive plan to deliver messaging against both ZEV benefits and overcoming barriers to ZEV adoption. Media will be used to put ZEVs on big stages in order to help consumers see that ZEVs not only meet the majority of their needs today, but also, as infrastructure networks grow further, adoption barriers continue to be reduced.

A preliminary illustration of this 360 degree messaging is summarized in Figure 11. A more detailed view of this is still under development by the creative and media agencies, but the messaging will be split across traditional advertising channels like TV, targeted digital advertising channels including digital radio, social media, websites, and partnerships with various platforms to further spread messaging.

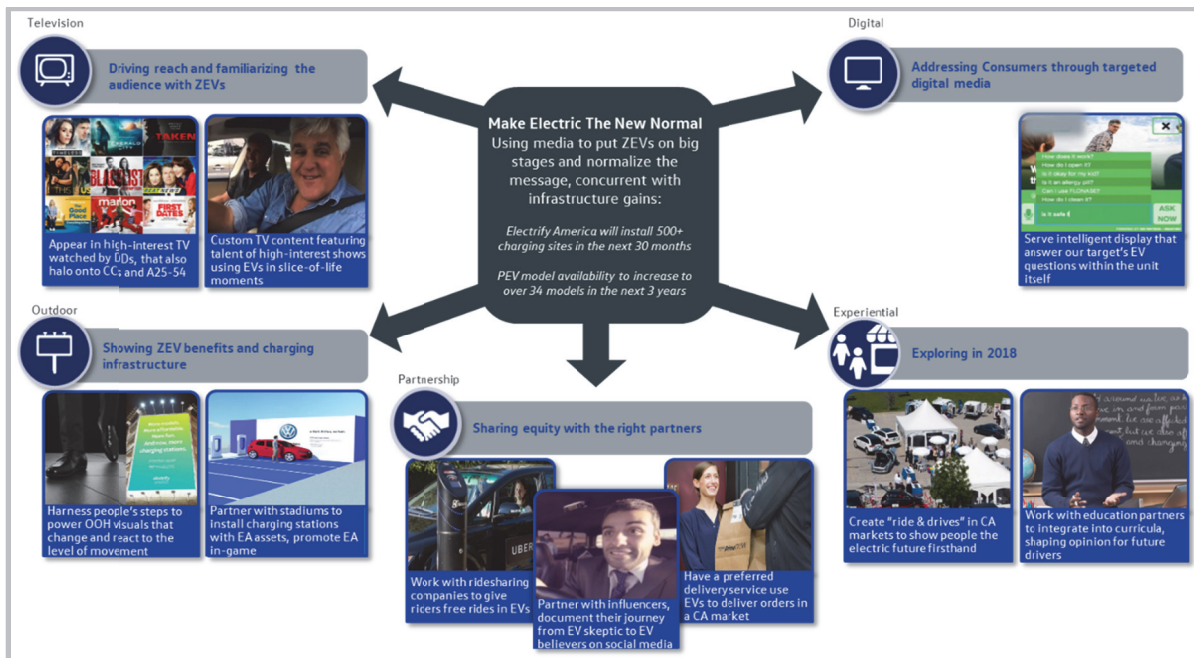


FIGURE 11: PRELIMINARY MULTI-CHANNEL APPROACH TO REACH CONSUMERS AT CRITICAL TOUCHPOINTS

In order to quickly maximize messaging presence, a coordinated National/Local media strategy was developed. This allows for a quick ramp-up across the country, followed by sustained messaging in top high potential ZEV markets. An overview of these planning principles can be seen in Figure 12.

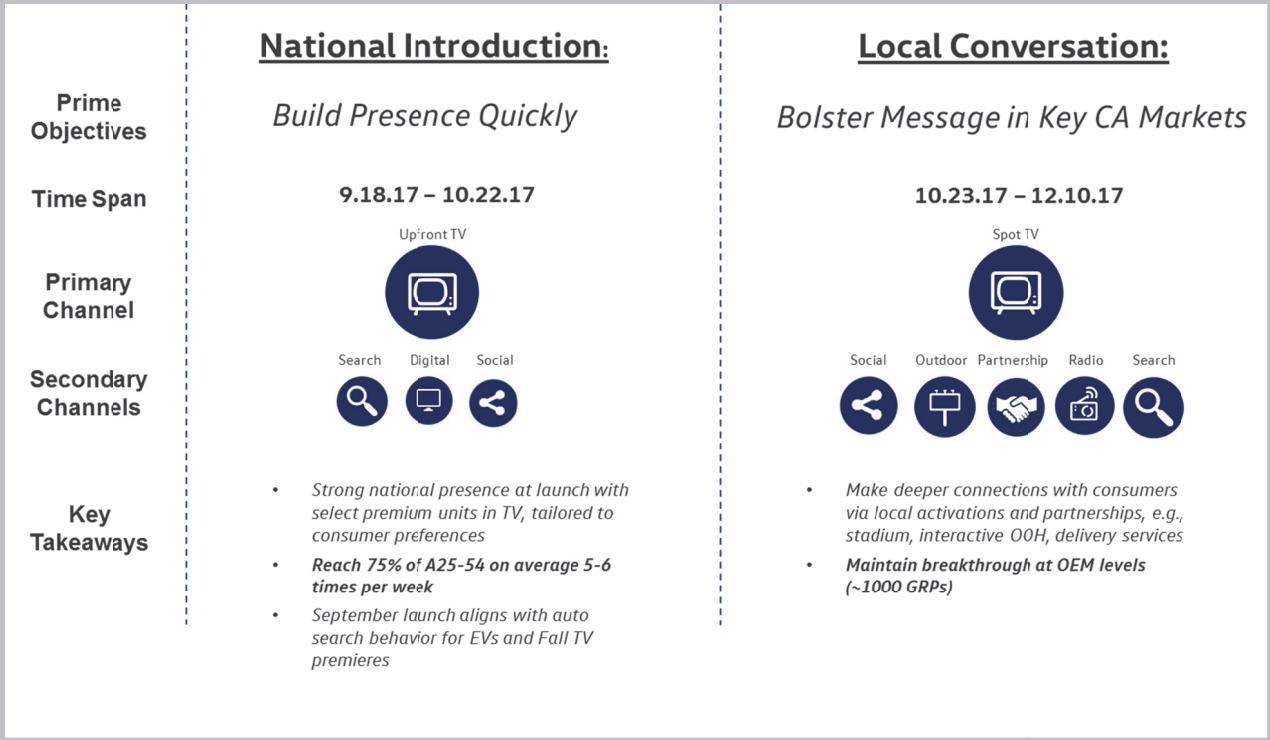


FIGURE 12: PRELIMINARY NATIONAL AND LOCAL MEDIA PLANNING PRINCIPLES

2.2.3.3. Public education timeline and milestones

Electrify America has hired an outside creative agency to refine the brand-neutral creative content based on the segmentation analysis (highlighting the most impactful benefits of ZEVs), and creative concepts should be finalized in the next month, followed by finalization of media planning by summer.

2.2.4. Public access initiatives

Experiential initiatives like ride-and-drive events are being planned to help increase ZEV access and exposure for as many Californians as possible. The purpose of these activities is to increase the public’s awareness of and access to ZEVs and allow them to experience ZEVs without having to purchase a vehicle. Options here are currently being explored, and updated information will be provided in future reporting cycles.

2.3. Anticipated Creditable Costs

Creditable costs for the first 30-month investment cycle have been identified across the twelve categories specified in §2.5.3 of Appendix C. The credible costs reflect Electrify America's current perspective and best estimate of anticipated costs, but are subject to change as the business continues to develop (e.g., vendors identified, full organization hired, office lease signed) and actual costs are incurred. Which costs incurred by Electrify America are credible costs is determined by the Final California Creditable Cost Guidance submitted to CARB in February 2017.

Specific credible costs that fall within the taxes and governmental fees line item have not yet been identified and will be detailed in future Annual ZEV Investment Reports. Utility costs are detailed separately for Infrastructure and Green City investments. Services provided through SLAs (Service Level Agreements) between Electrify America and other Volkswagen group companies include finance, tax, treasury, human resources, legal, and purchasing. As the vast majority of credible costs are driven by goods and services obtained pursuant to third-party contracts, additional detail has been provided for major investment categories (i.e., Infrastructure, Green City, Education/Access, Outreach, other Overhead).

2.4. Advancement of ZEV technology in the United States

The activities described in the California ZEV investment plan are designed to promote and support the increased use of ZEV technology in a number of ways:

- The ZEV infrastructure plan is designed to **increase the use of ZEVs in California**. The support of multiple use cases in the local community network and the spatial coverage of the highway network are intended to reduce range anxiety, which is cited as a primary barrier to ZEV adoption by prospective buyers.
- The gap between the current existing energy supplied by charging infrastructure and the projected demand calculated in the ZEV infrastructure investment selection methodology illustrates **there is a clearly existing present and projected need for the additional ZEV charging infrastructure** that the Electrify America network will help satisfy. As part of this, it is important to note that Electrify America accounted for existing infrastructure on prioritized highways and in prioritized metros.
- Electrify America will build charging stations in the areas of highest ZEV demand, where there is the **highest likelihood of utilization and provides accessibility/availability where most needed and most likely to be regularly used**.

- The ZEV infrastructure is intended for, and compatible with ZEV technologies **that are not limited to ones supported by VW group brands. Instead, the goal is to promote universal access to the extent possible.** In particular, multiple technologies (L2, DCFC) and **multiple non-proprietary connectors and charging protocols** (e.g., CHAdeMO, CCS) will be offered to maximize public access to Electrify America’s charging infrastructure.
- The combination of the above factors will help to **support and/or advance the market penetration of ZEVs in the US and help to build positive awareness of ZEVs.**

2.5. Certification of activities

Electrify America certifies that none of the activities described in the ZEV investment plan described above was/is:

- approved by the Board of Management prior to September 18, 2015
- required by a contract entered prior to the date of lodging of the Consent Decree
- a part of a joint effort with other automobile manufacturers to create ZEV infrastructure
- required to be performed by any federal, state, or local law, or anticipate will be required to perform during the planned 30-month period
- inclusive of funding for research

2.6. Supporting literature

In developing the methodology for the California ZEV Investment Plan, a number of sources from peer-reviewed academic literature, government, and industry were used. Important data and information from these sources was used to ensure that, in developing our plan, the investments have the highest likelihood of increasing the use of ZEVs in the U.S., address a clearly existing need, have a high likelihood of utilization and provide accessibility where most needed, support the market penetration of ZEVs, and help build positive awareness for ZEVs. For example, in developing our local community-based charger plan, a number of sources providing information on major U.S. metropolitan areas were used to determine the suitability of investment needed across metro areas, allowing us to select metros with the most significant need for investment in ZEV infrastructure. By doing this, the

methodology is selecting for those areas where there is a clearly existing need and where stations are most likely to be highly utilized.

A selection of key sources used is included below:

Auto Bild. <http://www.autobild.de/artikel/car2go-gibt-gruendungsstandort-ulm-auf-5419106.html>

California Center for Sustainable Energy. California plug-in electric vehicle driver survey results. Mar 2013.

Clark-Sutton, Kyle, Siddiki, Saba, Carley, Sanya, Wanner, Celeste, Rupp, John, and Graham, John D. (2016). Plug-in electric vehicle readiness: Rating cities in the United States. The Electricity Journal, 29, 1, 30-40.

Dale Kardos and Associates. EV incentives by state Q2 2016 update.

Edison Electric Institute (2016). EV market assessment and survey narrative summary. This was commissioned by us!

Esri street data. Esri GIS mapping software.

Experian (estimated 2020 total vehicles by CBSA). <http://www.experian.com/automotive/auto-vehicle-data.html>

Factiva press search or market reports on EV incentives / regulations. <http://global.factiva.com>

FHWA (annual miles driven), <https://www.fhwa.dot.gov/ohim/onh00/bar8.htm>

FHWA Traveler Analysis Framework (high traffic long-distance routes between CBSAs), <https://www.fhwa.dot.gov/policyinformation/analysisframework/01.cfm>

ICCT (International Council on Clean Transportation). "Assessment of leading electric vehicle promotion activities in United States cities." White paper (2015).

Idaho National Laboratory (2015). Plugged in: How Americans charge their electric vehicles – findings from the largest plug-in electric vehicle infrastructure demonstration in the world.

- IHS Markit (2016). "Alternative powertrain forecasts: USA market framework factors impacting electrification." Prepared for VW AG – K – GVS – V3.
- Kneebone, Elizabeth, & Holmes, Natalie (2015). The growing distance between people and jobs in metropolitan America. Washington D.C.: Brookings Institute, Metropolitan Policy Program.
- Kwan, Irene, Lutsey, Nic, Slowik, Peter, & Lingzhi, Jin (2016). Identifying the leading regional electric vehicle markets in the United States. International Council on Clean Transportation, working paper 2016-20.
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- Plugshare (existing charger locations and counts), <http://www.plugshare.com/>
- Searle, Stephanie, Pavlenko, Nikita, & Lutsey, Nic (2016). Leading edge of electric vehicle market development in the United States: an analysis of California cities. International Council on Clean Transportation, white paper.
- Shepard, Scott, & Jerram, Lisa (2016). Electric vehicle geographic forecasts – battery and plug-in hybrid electric vehicle sales and populations in North America. Boulder: Navigant Research.
- Supercharge.info (location of fast charger stations), <https://supercharge.info/>
- US Census Bureau (population statistics), <https://www.census.gov/>
- US Department of Energy (2015). Workplace charging challenge – mid-program review: employees plug-in.

US Department of Energy. Workplace Charging Challenge: Workplace PEV Ride and Drive,
<https://energy.gov/eere/vehicles/workplace-charging-challenge-workplace-pev-ride-and-drive>

US Energy Information Administration (nationwide electricity prices),
<http://www.eia.gov/electricity/data/browser/>

US Department of Transportation (2003). NHTS 2001 Highlights Report. Washington D.C.:
Bureau of Transportation Statistics.

US Department of Transportation (2011). Summary of travel trends – 2009 national household
travel survey. Washington D.C.: Federal Highway Administration.

US Utility Rate Database (URDB; utility rate plan information),
http://en.openei.org/wiki/Utility_Rate_Database